

## **REMARKS**

This Amendment responds to the non-final Office Action mailed on May 5, 2008. Claims 1-20 are pending. Claims 1 and 15 have been amended. In view of the foregoing amendments, as well as the following remarks, Applicants respectfully submit that this application is in complete condition for allowance and request reconsideration of the application in this regard.

### **Objections to the Drawings and Specification**

The Examiner objected to the drawings under 37 CFR § 1.83(a), asserting that the first, second, and third electrodes must be shown or cancelled from the claims. The Examiner also objected to the specification under 37 CFR § 1.75(d)(1) as failing to provide proper antecedent basis for the claimed first, second, and third electrodes. Applicants assume that these objections were prompted by typographical errors in independent claim 15 relating to which of the first, second, and third electrodes have the claimed relationships with the first and second tubular separating members. Fig. 9 of the present application and the description thereof (paragraphs [0051]-[0058]) disclose an upper electrode 22 (“first electrode”), a lower electrode 24 (“second electrode”), and an intermediate electrode 130 (“third electrode”). A first tubular separating member 26 is positioned between the upper and intermediate electrodes, and a second tubular separating member 132 is positioned between the intermediate and lower electrodes. Claim 15 has been amended to correctly recite this relationship.

In particular, as amended, claim 15 specifies that the first tubular separating member directly contacts the first and third electrodes (rather than the first and second electrodes, as previously recited), and that the second tubular member directly contacts the second and third electrodes. The first tubular separating member, first electrode, and third electrode are recited as “bounding a first vacuum enclosure.” The second tubular separating member, second electrode, and third electrode are recited as “bounding a second vacuum enclosure” (the claim previously recited the first electrode, rather than the second electrode, bounding the second vacuum enclosure). Finally, claim 15 has also been amended to clarify that the second electrode (rather than the third electrode) is “configured to support one of the plurality of substrates in said second vacuum enclosure for plasma processing.”

In view of these claim amendments and the disclosure mentioned above, Applicants respectfully submit that the objections to the drawings and specification are now moot. Therefore, Applicants request that the objections be withdrawn.

### **Rejection of Claims under 35 U.S.C. § 102**

Claims 1, 5, 6, 18, and 20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,251,216 to Okamura et al. (hereinafter *Okamura*). The Examiner contends that Fig 1 of *Okamura* shows a plasma processing apparatus 12 comprising a first electrode 13, a second electrode 11, and a tubular separating member 25 directly contacting the first and second electrodes to define a sidewall extending therebetween. *See* Office Action mailed May 5, 2008, p. 3. Although Applicants disagree with the Examiner's characterization of element 25 in *Okamura* as a "tubular separating member," Applicants have nevertheless amended claim 1, which is the only independent claim subject to this rejection, to advance prosecution.

In particular, claim 1 specifies that the tubular separating member, first electrode, and second electrode bound a vacuum enclosure. The claim has been amended to further recite that the tubular separating member comprises "a first surface exposed to the pressure inside said vacuum enclosure isolating said vacuum enclosure from air at atmospheric pressure." Thus, the first surface bounds the vacuum enclosure, as described in paragraph [0032] of the application, so that the tubular separating member defines a boundary between the vacuum enclosure and air at atmospheric pressure. This aspect is shown in at least Figs. 3B and 4 of the application, which illustrate a separating ring 126 ("tubular separating member") isolating an evacuated processing region 40 ("vacuum enclosure") from a "continuous air-filled spaced . . . encircling the perimeter of the electrodes 22, 24 and separating ring 26." Paragraph [0033]. To this end, air occupies the gaps 56, 58 on the side of the separating ring opposite from the surface exposed to the processing region.

In contrast to amended claim 1, *Okamura* discloses a reaction chamber 10, an upper electrode 13 within the reaction chamber, and a lower electrode 11 defining a portion of the bottom of the reaction chamber. As shown in Fig. 1 of *Okamura*, the internal walls of the reaction chamber define a plurality of surfaces extending at right angles to each other so as to have a step-like configuration. These internal walls are covered with protective members 26 made of synthetic quartz. As mentioned above, the Examiner points to these protective members

for the disclosure of a “tubular separating member.” The term “tubular” is commonly understood to refer to a hollow cylinder,<sup>1</sup> and nothing in the present application indicates an intent to deviate from this ordinary meaning. Applicants fail to see how the protective members in *Okamura* can be regarded as a “tubular” structure when they have the same step-like configuration as the walls they cover.

In any event, *Okamura* fails to disclose the protective members and the first and second electrodes “bounding a vacuum enclosure,” as further recited in claim 1. A view port 26 provides a discontinuity between the protective members on one side of the reaction chamber, and a gas outlet port 22 provides a discontinuity between the protective members on an opposite side of the reaction chamber.

Additionally, the protective members in *Okamura* clearly lack “a first surface exposed to the pressure inside said vacuum enclosure isolating said vacuum enclosure from air at atmospheric pressure,” as further recited in claim 1. Because the protective members line the internal walls of the reaction chamber, they do not and cannot define a boundary between the inside of the reaction chamber and air at atmospheric pressure. There is no open space bordering the protective members outside of the reaction chamber for air to occupy. Instead, the walls 10a, 10b, 10c of the reaction chamber are what isolate the inside of the reaction chamber from air at atmospheric pressure.

For a reference to anticipate the invention in a claim, the reference must teach each and every element in the precise arrangement set forth in the claim. If the reference fails to teach even one of the claimed elements, the reference does not and cannot anticipate the claimed invention. *Okamura* fails to teach at least a “tubular separating member” having the arrangement claimed. Therefore, Applicants respectfully request that the rejection of claim 1 under 35 U.S.C. § 102(b) be withdrawn.

Because claims 5, 6, 18, and 20 depend from independent claim 1, Applicants submit that *Okamura* fails to anticipate these claims for at least the same reasons as claim 1. Furthermore, these claims recite unique combinations of elements not taught, disclosed, or suggested by *Okamura*.

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<sup>1</sup> *Webster's II Dictionary* (3d ed. 2005), p. 751 (defining “tubular” as “having the form of a tube,” and defining “tube” as a “hollow cylinder”).

## **Rejection of Claims under 35 U.S.C. § 103**

### Claims 2, 3, 8, 9, 10, and 19 over Okamura in view of Shan

Claims 2, 3, 8, 9, 10, and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Okamura* in view of U.S. Patent No. 5,891,350 to Shan et al. (hereinafter *Shan*). Each of these claims depends from claim 1, directly or indirectly. As discussed above, *Okamura* fails to teach or suggest at least the “tubular separating member” recited in amended claim 1. Applicants respectfully submit that *Shan* fails to cure this deficiency.

Indeed, *Shan* merely discloses an anode shield 10 positioned between a cathode 30 (identified by the Examiner as a first electrode) and a chamber lid 24 (identified by the Examiner as a second electrode). As pointed out in the Amendment submitted on March 13, 2008, the anode shield in *Shan* fails to directly contact the cathode. As a result, the anode shield, cathode, and chamber lid do not bound a vacuum enclosure; additional structure extending between the anode shield and cathode is required to bound such an enclosure. Thus, like *Okamura*, *Shan* fails to disclose a tubular separating member having the arrangement recited in independent claim 1. For at least this reason, Applicants request that the rejection of dependent claims 2, 3, 8, 9, 10, and 19 under 35 U.S.C. § 103(a) be withdrawn.

### Claims 15-17 over Okamura in view of Suntola, and Maher

Claims 15-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Okamura* in view of U.S. Patent No. 5,711,811 to Suntola et al. (hereinafter *Suntola*) and U.S. Patent No. 4,381,965 to Maher, Jr., et al. (hereinafter *Maher*). Of these claims, claim 15 is the sole independent claim. Applicants respectfully submit that independent claim 15 is patentable for at least the same reasons as independent claim 1.

Claim 15 is similar to claim 1, but recites “a third electrode positioned between said first electrode and said second electrode.” A “first tubular separating member” directly contacts the first and third electrodes, with these three claim elements “bounding a first vacuum enclosure.” Also similar to claim 1, claim 15 has been amended to recite that the first tubular member comprises “an inwardly-facing surface exposed to the pressure inside said first vacuum enclosure isolating said first vacuum enclosure from air at atmospheric pressure.” Applicants describe how *Okamura* fails to teach or suggest such a tubular separating member above. It follows that *Okamura* also fails to teach or suggest a second tubular member having a similar relationship with respect to the claimed second and third electrodes. Similar to the first tubular separating

member, the second tubular separating cooperates with the two associated electrodes to bound a second vacuum enclosure. The second tubular member likewise comprises “an inwardly-facing surface exposed to the pressure inside said second vacuum enclosure isolating said second vacuum enclosure from air at atmospheric pressure.” *Suntola* and *Maher* fail to remedy the deficiencies of *Okamura* relating to the first and second tubular separating members.

Indeed, none of the planar elements 32 in *Suntola*, which the Examiner points to for the disclosure of first and second separating members, interact with two electrodes to bound a vacuum enclosure. *Maher* is merely relied upon by the Examiner for the disclosure of a plasma processing apparatus having pairs of parallel electrodes 19a,b-25a,b and associated dielectric layers 19c-25c. The dielectric layers are not tubular separating members bounding a vacuum enclosure between the associated electrodes, nor does any one of the electrodes directly contact two different dielectric layers. For at least these reasons, Applicants submit that claim 15 is patentable over the combination of *Okamura* in view of *Suntola* and *Maher*.

Because claims 16 and 17 depend from independent claim 15, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, these claims recite unique combinations of elements not disclosed or suggested by the combined disclosures of *Okamura*, *Suntola*, and *Maher*.

Therefore, for at least the above reasons, Applicants respectfully request that the rejection of claims 15-17 under 35 U.S.C. § 103(a) be withdrawn.

Claims 4, 7, and 11-14 over Okamura in view of Shan and Hirooka

Claims 4, 7, and 11-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Okamura* in view of *Shan* and U.S. Patent No. 6,700,089 to *Hirooka* (hereinafter *Hirooka*). Applicants respectfully submit that *Hirooka* fails to remedy the fundamental deficiencies of *Okamura* and *Shan* relating to the “tubular separating member” recited in independent claim 1. Indeed, the Examiner merely relies on *Hirooka* for the disclosure of a vacuum port, a process gas port, and a movable lid. *See* Office Action mailed May 5, 2008, pp. 16-17.

Because claims 4, 7, and 11-14 depend from independent claim 1, Applicants submit that these claims are patentable for at least the same reasons as independent claim 1. Furthermore, claims 4, 7, and 11-14 recite unique combinations of elements not disclosed or suggested by *Okamura* in view of *Shan* and *Hirooka*. Therefore, Applicants request that the rejection of claims 4, 7, and 11-14 under 35 U.S.C. § 103(a) be withdrawn.

## **CONCLUSION**

Applicants have made a bona fide effort to respond to each and every requirement set forth in the Office Action. In view of the foregoing amendments and remarks, this application is submitted to be in complete condition for allowance and, accordingly, a timely notice of allowance to this effect is earnestly solicited. In the event that any issues remain outstanding, the Examiner is invited to contact the undersigned to expedite issuance of this application.

Applicants do not believe any fees are due in connection with filing this communication. However, if such petition is due or any fees are necessary, the Commissioner may consider this to be a request for such and is hereby authorized to charge any under-payment or fees associated with this communication, or to credit any over-payment, to Deposit Account No. 23-3000.

Respectfully submitted,  
WOOD, HERRON & EVANS, L.L.P.

By: /Adam R. Weeks/  
Adam R. Weeks  
Reg. No. 62,266

2700 Carew Tower  
Cincinnati, Ohio 45202  
(513) 241-2324 (voice)  
(513) 241-6234 (facsimile)